

Applicants respectfully acknowledge the courtesies extended to Applicants' representative during the January 23, 2002 telephone interview. The points discussed during the interview are incorporated herein. During the interview, the Examiner maintained her position with respect to the prior art rejection of claims 1-12. Applicants respectfully disagree with the interpretation of the applied references discussed during the personal interview for the reasons set forth below. Furthermore, Applicants respectfully submits that each of the claims recite subject matter that is neither disclosed nor suggested by the prior art.

35 U.S.C. § 112 Claims rejections

Claims 1-12 were rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specifically the Office Action asserted that it appears that the specification, as originally filed, fails to clearly provide support for the auto pallet changer being of or pertaining to the machining tool and the claimed waiting position pertaining to or being of an auto pallet changer of machining tool. By this amendment, claims 1, 5 and 12 have been amended. Support for the amendments can generally be found in Applicants' specification, for example, at pages 1 and 9, and Fig. 5. As is evident, the invention as claimed is clearly described in the specification. Therefore, the rejection is moot. The Applicants respectfully request that the rejection to be withdrawn.

35 U.S.C. § 102(b)

Claim 12 was rejected under 35 U.S.C. § 102(b) as being anticipated by Yoshida et al. (U.S. Patent No. 4,473,883, "Yoshida"). Applicants submit that claim 12 recites subject matter which is neither disclosed nor suggested in the prior art.

Claim 12 recites a coordinate-measuring machine, disposed in the vicinity of a machining tool, for getting a probe thereof close to a work in a waiting position of an auto pallet changer, directly after said work is machined by said machining tool and placed on said waiting position, to thereby measure the forms and dimensions of said work.

The Office Action took the position that Yoshida discloses all the elements of the claimed invention. However, it is respectfully submitted that the prior art fails to disclose or suggest the claimed invention, and therefore, fails to provide the structure and advantages that are provided by the present invention. For example, the present invention provides that the coordinate-measuring machine is disposed in the vicinity of a machining tool, for getting a probe thereof close to a work in a waiting position of an auto pallet changer directly after the work is machined by the machining tool and placed on the waiting position, to thereby measure the forms and dimensions of the work. As stated in Applicants' specification generally at page 5, this causes the coordinate-measuring machine to be easily installed into machining line.

The Office Action referred to Figure 14 for teaching a coordinate-measuring machine [MUNT] disposed in the vicinity of a machining tool [MT1]. The Office Action asserted that the coordinate-measuring machine [MUNT] inherently included a probe. Additionally, the Office Action asserted that with respect to the limitation "for bringing a probe thereof close to a work in a waiting position of an auto pallet changer of said

machining tool, having been machined by said machining tool, placed on said waiting position, to thereby measure the forms and dimensions of said work," was insufficient to patentably distinguish the prior art from the claimed invention because the claim fails to set forth structural limitations of the coordinate-measuring machine and because the limitation is directed to a manner in which the coordinate-measuring machine is to be used, these claim limitations are intended use and do not differentiate the claimed apparatus from the prior art. However, Applicants respectfully disagree. Claim 12 positively recites that there is a coordinate-measuring machine, disposed in the vicinity of a machining tool, for getting a probe thereof close to a work in a waiting position of an auto pallet changer, directly after said work is machined by said machining tool and placed on said waiting position, to thereby measure the forms and dimensions of said work. This is a clear structural relationship.

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According to MPEP § 2173.05(g), functional limitations must be considered, the same as any other limitation of a claim, and evaluated for what it conveys to a person of ordinary skill in the art. The recitations cited by the Office Action serve to precisely define the structural attributes of interrelated component parts of the claimed assembly. Therefore, because Yoshida fails to disclose or suggest the claimed invention, Applicants respectfully request that the rejection be withdrawn.

Claims 1, 4, and 12 were rejected under 35 U.S.C. § 102(b) as being anticipated by Yoshida (U.S. Patent No. 4,473,883). Applicants submit that claims 1, 4 and 12 recite subject matter which is neither disclosed nor suggested in the prior art.

Claim 1 recites a work form-measuring method including the steps of placing a work on a waiting position of an auto pallet changer directly after the work is machined by a machining tool. Thereafter, a probe is brought of a coordinate-measuring machine

close to the work in the waiting position of the auto pallet changer and then the forms and dimensions of the work are measured. The coordinate-measuring machine is arranged in the vicinity of the machining tool.

Consequently, the present invention measures the work at the waiting position of the auto pallet changer (APC) that transfers the work directly to/from the machine tool.

The Office Action took the position that Yoshida discloses all the elements of the claimed invention. However, it is respectfully submitted that the prior art fails to disclose or suggest the claimed invention, and therefore, fails to provide the steps, the structure, and the advantages that are provided by the present invention. For example, the present invention provides for placing a work on a waiting position of an auto pallet changer directly after the work is machined by a machining tool. Thereafter, a probe is brought of a coordinate-measuring machine close to the work in the waiting position of the auto pallet changer and then the forms and dimensions of the work are measured. The coordinate-measuring machine is arranged in the vicinity of the machining tool. This provides a work form measuring method and device which are capable of shortening the production line, including the measurement, as discussed generally in Applicants' specification at pages 2 and 3.

Yoshida appears to disclose a machining system and control system therefore. This system includes a pallet magazine 11 on which a plurality of pallets PA are carried, with each pallet PA being carried on a pallet table. Located near the pallet magazine 11 are one or more pallet changers APC1 and APC2, associated with a respective machining center MT1 and MT2. Also shown near pallet magazine 11 is pallet changer APC4 which serves measuring unit MUNT (as shown in Fig. 14). Yoshida teaches using a coordinate-measuring machine MUNT to measure the work in a waiting

position of an auto pallet changer APC4 and then measuring the form and dimension of the work.

While Yoshida discloses measuring the work at a waiting position of a APC, Yoshida fails to disclose or suggest measuring the work at a waiting position of a APC directly after machining, as recited in the current claims. Consequently, Yoshida fails to disclose or suggest each element of the claimed invention. Therefore, Applicants respectfully request that the rejection be withdrawn.

35 U.S.C. § 103(a)

Claims 2 and 3 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoshida in view of Dailey (U.S. Patent No. 4,629,053). The Office Action took the position that Yoshida discloses the claimed invention, except for disclosing the direction of motion of the tool of the machining tool and the direction of motion of the probe/measurement had of said coordinate-measuring machine. Dailey was cited for teaching these limitations. Applicants respectfully request reconsideration and withdrawal of this rejection.

The Office Action admits that Yoshida fails to explicitly disclose that the direction of motion of the probe of the coordinate-measuring machine moving to the work is the same as that of a tool of the machining tool moving to the work. The Office Action cites Dailey as correcting this deficiency in Yoshida.

Dailey appears to teach a machining system whereby a work piece could be transferred from one standalone machine tool to another standalone machine tool. This transfer is accomplished by using a plurality of work piece transfer units. Upon careful review of Dailey, however, no reference to a coordinate-measuring machine could be found. Furthermore, Applicant could not find any disclosure or suggestion that it would

be desirable for the direction of motion of the probe/measurement head of the coordinate-measuring machine moving to the work with the same direction of motion as the tool of the machine tool. Even though Dailey teaches the use of horizontal machining centers with rotating worktables, it appears that Dailey fails to teach and/or suggest the use of a coordinate-measuring machine or that the direction of motion of the probe of the coordinate-measuring machine should move to the work in the same manner as that of a tool of the machine tool moving to the work.

Assuming *aguedo* that Yoshida is modified by Dailey in the manner suggested by the Office Action, the resulting combination would simply teach a machining tool moving in a horizontal direction. This combination still fails to disclose each limitation recited in claims 2 and 3. Furthermore, the Office Action has failed to point to any teaching in the prior art that would compel one of ordinary skill to modify Yoshida in the manner suggested. Therefore, Applicants submit that this is impermissible reconstruction because the only reason for the modification was gleaned from Applicants' disclosure.

Since Dailey fails to teach and/or suggest both a coordinate-measuring machine and that the direction of motion of the probe of the coordinate-measuring machine moving to the work is the same as that of a tool of the machining tool moving to the work; Dailey fails to correct the admitted deficiency in Yoshida. Therefore, Applicants request reconsideration and withdrawal of the rejection of claims 2 and 3 under 35 U.S.C. § 103(a).

Furthermore, since claims 2 and 3 are directly or indirectly dependent on independent claim 1, Applicants submit that each of these claims recite subject matter

that is neither disclosed nor suggested by the prior art, for at least the same reasons set forth with respect to claim 1.

Claims 5-11 were also rejected under 35 USC §103(a) as being unpatentable over the combination of Yoshida and Dailey (both discussed above).

Claim 5 recites a work form-measuring apparatus including an auto pallet changer for moving a work between a waiting position and a machining position at an inlet of a machining tool. A coordinate-measuring machine brings a probe thereof close to the work in the waiting position of the auto pallet changer directly after the work is machined by the machining tool and placed on the waiting position, to thereby measure the forms and dimensions of the work.

The Office Action asserted that the pallet magazine 11 of the system described in Yoshida permits the user to set a waiting time for a particular work piece to cool between machining steps. Consequently, the Office Action asserted that due to this time delay, Yoshida fails to disclose one auto pallet changer moving the work between a machining position and a waiting position where the forms and measures of the work are measured by a coordinate measuring machine. However, a careful review of Yoshida indicates not every work piece will have a waiting time set for that work piece. Furthermore, if each work piece in Yoshida had a required minimum waiting time, Yoshida would teach away from the concept of having the work measured while the work was in a waiting position after being machined.

The Office Action asserted that Dailey corrects this deficiency in Yoshida. While Dailey discloses a closed loop machining system in which work on a pallet is displaced directly from one machine tool to the inlet of the next machine tool, Dailey fails to disclose moving a work piece directly from one machine tool to a coordinate-measuring

machine, since Dailey fails to disclose and/or suggest the need for a coordinate measuring device in the system disclosed. Thus, it appears that the combination of Yoshida and Dailey would merely teach moving a work piece directly from machine center MT1 to machine center MT2.

Furthermore with respect to the refuge means recited in claims 6, 7, 8 and 10, the Office Action took the position that a coordinate measuring means inherently comprises a refuge means and that the direction of motion in which the measuring means takes refuge is a matter of design choice or engineering skill. However, the Applicants respectfully disagree. In Applicants' specification generally at pages 4, 5, 12 and 13, it is discussed, for example, that the refuge means is adapted to cause the coordinate-measuring machine to take refuge in a linear motion, which requires only simple construction to take refuge or the refuge means is adapted to cause the coordinate-measuring machine to take refuge in a rotational motion, which requires only a small occupation of space to take refuge. Therefore, Applicants' specification demonstrates that this feature has a specific purpose and is not merely design choice. Additionally, the Office Action has failed to provide why it would have been obvious to modify Yoshida by implementing any of the aforementioned design choices.

Furthermore, with respect to claim 9, although the Office Action asserted that the combination of Yoshida and Dailey discloses that the machining tool in the coordinate-measuring machine are adapted to mutually exchange a measurement enabling signal and a measurement completion signal, both of which are related to the movement of said work by said changer, Applicants submit that the combination of Yoshida and Dailey fails to disclose or suggest a mutual exchange of enable signals between the coordinate-measuring machine and the machine tool. Upon further review of Yoshida, it

appears that a controller communicates to the coordinate-measuring machine and the machining tool. There is no teaching or suggestion in Yoshida that the coordinate-measuring machine and the machining tool mutually exchange enabling signals, unlike in the present invention wherein the coordinate-measuring machine and machining tool exchange enabling signals without being directed through a controller.

Furthermore, since claims 6-11 are directly or indirectly dependent on independent claim 5, Applicants submit that each of these claims recite subject matter that is neither disclosed nor suggested by the prior art, for at least the same reasons set forth with respect to claim 5.

Consequently, neither Yoshida nor Dailey disclose or suggest measuring the forms and measures of the work when the work is in a waiting position after being machined, or the refuge means, or that the machining tool in the coordinate-measuring machine are adapted to mutually exchange a measurement enabling signal and a measurement completion signal, as recited in the present claims. Thus, the combination of Yoshida and Dailey fails to teach disclose or suggest each element of the claimed invention. Therefore, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 5-11 under 35 U.S.C. § 103(a).

CONCLUSION


Applicants' amendments and remarks have clearly overcome the rejections and objections set forth in the Office Action dated October 11, 2001. Specifically, the amendments to claims 5 and 12 overcome the rejection of these claims under 35 U.S.C. § 112, first paragraph. Applicants' remarks have clearly distinguished claims 1, 4, and 12 from the cited prior art and thus overcome the rejection of these claims under 35 U.S.C. § 102(b). Applicants' remarks have also distinguished claims 2, 3, and 5-11

from the combination of Yoshida and Dailey and thus overcome the rejection of these claims under 35 U.S.C. § 103(a). Consequently, claims 1-12 are in condition for allowance. Therefore Applicants respectfully request reconsideration and allowance of claims 1-12.

Applicants submit that the application is now in condition for allowance. If the Examiner believes the application is not in condition for allowance, Applicants respectfully request that the Examiner contact the undersigned attorney by telephone, if it is believed that such contact will expedite the prosecution of the application.

The Commissioner is authorized to charge payment for any additional fees which may be required with respect to this paper to Deposit Account No. 01-2300, **referencing Attorney Docket No. 107292-09003.**

Respectfully submitted,


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MARKED-UP VERSION OF CLAIMS

1. (Three times Amended) A work form-measuring method comprising the steps of:

placing a work on a waiting position of an auto pallet changer [of a machining tool] directly after the work [has been] is machined by [said] a machining tool; and

bringing a probe of a coordinate-measuring machine close to said work in said waiting position of said auto pallet changer and then measuring the forms and dimensions of said work, said coordinate-measuring machine being arranged in the vicinity of said machining tool.

5. (Three times Amended) A work form-measuring apparatus comprising:
an auto pallet changer [of a machining tool] for moving a work between a waiting position and a machining position at an inlet of [said] a machining tool; and

a coordinate-measuring machine for bringing a probe thereof close to said work in said waiting position of said auto pallet changer, directly after said work is [having been] machined by said machining tool[,], and placed on said waiting position, to thereby measure the forms and dimensions of said work.

12. (Three times Amended) A coordinate-measuring machine₁ disposed in the vicinity of a machining tool₁ for getting a probe thereof close to a work in a waiting position of an auto pallet changer [of said machining tool], directly after said work is [having been] machined by said machining tool and placed on said waiting position, to thereby measure the forms and dimensions of said work.